Washington State Department of Health

ELABORATIONS

News and Issues for Washington's Clinical Laboratories

Volume VIII Issue 10 November/December 2003

Methicillin (oxacillin) resistant *Staphylococcus aureus*

by Kathryn MacDonald, PhD

Another chapter is being written in the long history of *Staphylococcus aureus*, an organism known as a familiar commensal and at the same time as a versatile and virulent pathogen.

Notable past developments in the natural history of *S. aureus* include:

- Production of the enzyme beta-lactamase that inactivates penicillin.
- Development of a novel penicillin-binding protein conferring resistance to penicillinase-resistant penicillins and cephalosporins (MRSA).
- An increase in hospital-acquired staphylococcal infections paralleling the increased frequency of invasive medical procedures over past decades.
- The worldwide increasing proportion of *S. aureus* infections attributed to methicillin (oxacillin) resistant strains.
- The development of strains of MRSA resistant to multiple other anti-microbial agents, including vancomycin.

The most recent chapter in the epidemiology of *S. aureus* infections describes the epidemic spread on several continents of MRSA clones in community populations outside of health care institutions. Outbreaks have been particularly prevalent in group settings such as correctional facilities and athletic teams; however, health care providers are reporting increasing numbers of MRSA cases in children and other persons without known risk factors for the infection.

S. aureus is a common cause of skin and soft tissue infections, including infected lacerations, folliculitis, furunculosis (boils), carbuncles, impetigo and cellulitis. Many patients with community-acquired MRSA skin lesions have presented with an initial (erroneous) complaint of "spider bites" or small pustular skin lesions. Patients may report that household members or friends have similar lesions. Some community onset cases have required hospitalization for treatment of serious abscesses or invasive infections. A small number of deaths from rapidly progressive community-acquired MRSA infections have been reported around the country.

In Washington this year, over thirty percent of outpatient *S. aureus* isolates tested by sentinel reporters are

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Inside This Issue

Practice Guidelines

The following practice guidelines have been developed by the Clinical Laboratory Advisory Council. They can be accessed at the following website:
www.doh.wa.gov/lqa.htm

Anemia	Lipid Screening
ANA	Point-of-Care Testing
Bioterrorism Event Mgmt	PSA
Bleeding Disorders	Red Cell Transfusion
Chlamydia	Renal Disease
Diabetes	STD
Group A Strep Pharyngitis	Thyroid
Hepatitis	Tuberculosis
HIV	Urinalysis
Intestinal Parasites	Wellness

Methicillin (oxacillin) resistant *Staphylococcus aureus*, continued from page 1

methicillin (oxacillin) resistant. Meanwhile hospital prevalence continues to rise as well, with inpatient *S. aureus* isolates approaching fifty percent oxacillin resistant. The rapid spread of community-acquired clones (CA-MRSA) is stimulating inquiry into whether certain of these stains possess virulence factors or other characteristics that confer special fitness as community pathogens.

With prevalence of MRSA increasing in outpatient and inpatient settings, and in rural as well as urban locations, bacterial culture is more frequently needed to guide the appropriate selection and use of antibiotics when staphylococcal infection is suspected. Some issues related to antibiotic susceptibility testing for *S. aureus* include:

- Although MRSA is the acronym still in common use, methicillin is no longer used for treatment or testing. Oxacillin, in addition to penicillin, is used to predict results for all other beta-lactam antibiotics. Resistance to all beta-lactams is reported with oxacillin resistance regardless of any susceptible result in vitro. According to current NCCLS standards, no other beta–lactams need to be tested.
- Laboratory detection of oxacillin resistance can be complicated by heteroresistance, whereby susceptible and resistant subpopulations coexist within a culture, and cells expressing resistance may grow more slowly than the susceptible population. For this reason, NCCLS recommends incubating isolates for a full 24 hours before reading.
- Most oxacillin resistant isolates in Washington are also resistant to erythromycin. Community acquired isolates generally exhibit clindamycin sensitivity in vitro; however, some strains resistant to erythromycin have an inducible clindamycin resistance, which may be selected for during clindamycin therapy. In vitro inducible clindamycin resistance is detected through the use of a double disk diffusion assay (D test) which should be performed before reporting clindamycin results.
- The emergence of vancomycin resistant *S. aureus* presents a formidable treatment challenge in the future. Reduced susceptibility to vancomycin (VISA) is not reliably detected by routine testing methods. Laboratories using automated or disk diffusion methods can enhance their ability to detect reduced susceptibility by using a vancomycin agar plate screen. Any suspected vancomycin intermediate or resistant result will require confirmatory MIC testing, verification of organism identification and susceptibility results, and reporting to the public health department and CDC.

Resources

- More information on laboratory testing of Staphylococcal antibiotic resistance is available from CDC at: http://www.cdc.gov/ncidod/hip/lab/lab.htm.
- Information on MRSA and links to additional information sources are available at the DOH web page: http://www.doh.wa.gov/Topics/Antibiotics/providers.htm.
- For an illustration and discussion of the D test for inducible clindamycin resistance see *Clinical Infectious Diseases* 2003;37:1257-60.

"ELABORATIONS" is a free monthly publication of the Washington State Department of Health (DOH) Public Health Laboratories (PHL) and Office of Laboratory Quality Assurance (LQA).

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NOTE: Letters to the editor may be published unless specified otherwise by the author.

Website addresses:
DOH home page: http://www.doh.wa.gov
LQA home page: http://www.doh.wa.gov/lqa.htm
PHL home page:
http://www.doh.wa.gov/EHSPHL/PHL/default.htm

Influenza Surveillance

by Beth Weiman

Washington State DOH has an influenza surveillance program which is coordinated with state epidemiologists, the state Public Health Laboratories, and selected physicians and nursing homes throughout Washington. This year the surveillance program includes at least 25 physicians and 36 nursing homes. Specimens are also received from local county health departments and three private virology laboratories.

This year influenza cases have begun appearing very early for Washington, with the first positive cultures received in mid-October. Since October, three physicians, all three private virology laboratories, and several local county health departments have sent specimens that contained influenza virus as detected by culture. Twenty-three of the cultures have been identified as Influenza A(H3N2). Seven cultures have been negative for influenza. Nine cultures are in progress, with the outcome unknown.

Early influenza activity does not necessarily mean that there will be a longer influenza season, or that it will be a more severe season. No one can predict the length or severity of the viruses circulating. We do know it is early, and we do know from preliminary results from the Center for Disease Control and Prevention in Atlanta, Georgia that there is a variant strain, closely related to what is in the trivalent vaccine, circulating. What this means is that while the vaccine may not completely protect us from the variant strain, it will offer protection to some degree and should reduce the severity and chance of death if someone is infected.

Basic Microscopy Training Course

by Shelley Lankford

On February 11 & 12, 2004 the WA State DOH Public Health Laboratories Training Program will be offering half-day courses in basic microscopy. Upon completion of this course, students will know the parts of a microscope, understand how a light microscope works, learn the different types of microscopes and their uses, learn the different types of lights and lenses used for microscopes, learn how to focus and setup Kohler illumination, and how to calibrate an ocular micrometer. How to prepare microscope slides for the best viewing, microscope ergonomics, and a section on cleaning and care of a microscope will be presented in this course as well. If time allows, we will discuss tips on microscope purchasing.

The audience for this class is anyone who is a beginner at performing microscopic analysis or any lab professional with some microscope skills who would like to learn more about the use and care of microscopes.

If you would like more information about this class, call Shelley Lankford, Training Program Manager, at (206) 361-2810 or e-mail the training Program at PHL.training@doh.wa.gov. You can also download training registration forms at the Public Health Laboratories Training Program website at http://www.doh.wa.gov/EHSPHL/PHL/train.htm.

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Basic Microscopy Training Course Registration Form

Name: _____

Employer:_____

Employer Address:_____

City: _____State: _____Zip:_____

Work Phone:_____FAX: _____

E-mail:_____ Message Phone: _____

Class date preference: (check one) ☐ **Wednesday, Feb 11, 2004** ☐ **Thursday, Feb 12, 2004**

HOW TO REGISTER: Complete the registration form and mail to the Department of Health, PHL Training Program **1610 NE 150th Street * PO Box 550501* Shoreline, WA 98155-9701** or **FAX to: (206) 361-2904**. A confirmation packet will be sent to you by mail. The packet will contain your registration confirmation, payment instructions and a map to the course location. Please do not send money with your registration form.

Registration Deadline: Friday, January 23, 2004

Helpful Hints

Attention OraQuick Rapid HIV-1 Antibody Test Users

Important changes made to the OraQuick Rapid HIV-1 Antibody test protocol as of October 2003 include:

√ **Test results MUST BE READ BETWEEN 20 and 40 minutes.** The original package insert indicated that the test results could be read between 20 and 60 minutes.

√ The Food and Drug Administration has approved the OraQuick Rapid HIV-1 test for fingerstick **AND VENIPUNCTURE WHOLE BLOOD**. Previously the test was approved only for fingerstick specimens.

Refer to www.orasure.com for more information about these important changes.

NOTE: If you are using this test kit in your facility and have not notifed the DOH Office of Laboratory Quality Assurance, please send an e-mail notification to gail.neuenschwander@doh.wa.gov.

2004 - Calendar of Events

PHL Training Classes:
(http://www.doh.wa.gov/EHSPHL/PHL/train.htm)

Basic Microscopy

February 11	Shoreline
February 12	Shoreline

WSSCLS/NWSSAMT Spring Meeting

April 29-May 1	Vancouver

Northwest Medical Laboratory Symposium

October 20-23	Portland

11th Annual Clinical Laboratory Conference

November 8	Seattle

Contact information for the events listed above can be found on page 2. The Calendar of Events is a list of upcoming conferences, deadlines, and other dates of interest to the clinical laboratory community. If you have events that you would like to have included, please mail them to ELABORATIONS at the address on page 2. Information must be received at least one month before the scheduled event. The editor reserves the right to make final decisions on inclusion.

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